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Taxonomic Paper

# A new species, first report of a male and new distributional records for three species of *Pteroptrix* (Hymenoptera: Aphelinidae) from China

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## Abstract

### Background

The Chinese fauna of *Pteroptrix* currently includes 26 species, of wihich 19 species were described originally as new from China: 2 by Howard (1907), 2 by Compere (1953), 1 by Flanders (1966), 1 by Viggiani and Ren (1986), 4 by Huang (1991), 4 by Huang et al. (1992), 1 by Viggiani and Ren (1993), 4 by Huang (1994).

### New information

*Pteroptrix pedicellata* **sp. n.** is described in detail and illustrated; the male of *P. processa* (Huang) is reported for the first time. New distributional data for three species, *P. leptocera* (Huang), *P. orientalis* (Silvestri) and *P. processa* (Huang), are also provided from China.

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## Keywords

*Pteroptrix pedicellata*, Chalcidoidea, Coccophaginae, taxonomy.

## Introduction

The genus *Pteroptrix* was established by Westwood (1833) with *Pteroptrix dimidiatus* Westwood as the type species and currently comprises 71 valid species (Noyes 2016). All the species of the genus are parasitoids of armoured scale insects (Hemiptera: Diaspididae) which are economically important pests. The taxonomy of the genus had been highly controversial for a long time until Viggiani and Garonna (1993) proposed *Archenomus* Howard and *Aphelosoma* Nikol'skaya as synonyms of *Pteroptrix*. Faunal contributions to the systematic study of the genus had been made by several authors, such as Hayat (1979) on the Australian fauna; Prinsloo and Neser (1990) on the southern Afrotropical fauna; Nikol'skaya and Yasnosh (1966), Viggiani and Garonna (1993) on the European fauna; Abd-Rabou (2002) on the Egyptian fauna; Myartseva (2009) on the Mexican fauna; Hayat (1998), Hayat and Khan (2010) on the Indian fauna; Huang (1994) on the Chinese fauna.

## Materials and methods

All specimens in the present study were collected by sweeping, or yellowpan trapping, then dissected and mounted in Canada balsam on slides following the method described by Noyes (1982). Photographs were taken with a digital CCD camera attached to an Olympus BX51 compound microscope and final modifications to the images were made using Adobe Photoshop. Most measurements were made from slide-mounted specimens using a reticle eyepiece in a microscope, except the total body length (excluding the ovipositor) which was measured from alcohol-preserved specimens before being dissected. All measurements are given in micrometres (µm) except body length which is measured in millimetres (mm). Scale bars are 100µm except those which are specifically indicated. All the specimens listed below are deposited in Northeast Forestry University, Harbin, China.

Terminology follows Hayat (1998) except mesosoma is used for the thorax plus propodeum and metasoma for the petiole plus gaster. The following abbreviations are used in the text:

F1–3: funicle segments 1–3

C1–3: clava segments 1–3

OAL: distance between a posterior ocellus and the anterior ocellus

OCL: distance between a posterior ocellus and occipital margin

OOL: distance between a posterior ocellus and eye margin

TI, TII, etc.: tergites 1, 2, etc. of gaster

The following acronyms are used for the depositories:

FACC: Fujian Agriculture and Forestry University, Fuzhou, Fujian, China

NEFU: Northeast Forestry University, Harbin, China

## Taxon treatments

### *Pteroptrix pedicellata* Li & Chen, 2017, sp. n.

- ZooBank urn:lsid:zoobank.org:act:5F2936C8-208B-410A-BEAF-C9AE5B7BCFCC

#### Materials

*Holotype:*

a. scientificName: *Pteroptrix pedicellata*; country: China; stateProvince: Tibet; county: Chayu; municipality: Xiachayu Town; samplingProtocol: sweeping; eventDate: 2015-05-15; sex: female; lifeStage: adult; recordedBy: Ye Chen; Chao Zhang; identifiedBy: Cheng-de Li; Ye Chen; dateIdentified: 2016-11; institutionCode: NEFU

*Paratype:*

a. scientificName: *Pteroptrix pedicellata*; country: China; stateProvince: Tibet; county: Chayu; municipality: Xiachayu Town; samplingProtocol: sweeping; eventDate: 2015-05-15; sex: 3 females; recordedBy: Ye Chen; Chao Zhang; identifiedBy: Cheng-De Li; Ye Chen; dateIdentified: 2016-11; institutionCode: NEFU

#### Description

Female. Holotype. Body length 0.51 mm. Head dark brown, eyes black. Antenna mostly brown except pedicel and C1 paler. Thorax with pronotum, most part of mid-lobe of mesoscutum and axillae dark brown, side lobes and posterior part of mid-lobe of mesoscutum pale brown, scutellum and propodeum yellowish-white. Scutellum with light blue reflection in dorsal view. Wings hyaline, distinctly infuscated below marginal vein of fore wing, venation brown. Legs extensively dark brown, except fore coxae apically, mid coxae completely, apical half of all tibiae and tarsi pallid. Metasoma dark brown with the third valvula pale brown.

Head (Fig. 1a), in frontal view, about as long as wide; frontovertex about 0.5× head width. Ocellar triangle with apical angle obtuse. OOL larger than OCL and subequal to OAL. The sculpture and setation on the upper face as in a. Toruli with lower margins separated from mouth margin less than their own longest diameter and distance between toruli about as long as their longest diameter. Mandible tridentate. Antenna (Fig. 1b) with radicle 2.0× as long as wide, scape 4.75× as long as wide; pedicle 1.76× as long as wide and 1.20× as long as F1; F1 1.79× as long as wide, F2 subquadrate and 0.68× as long as F1; C1 2.3× as long as wide, a little longer than the two funicle segments combined; C2 about as long as or somewhat shorter than C1; C3 a little

longer than both C1 and C2; three clava segments gradually decreasing in width distad. Measurements, length (width): radicle, 30 (15); scape, 95 (20); pedicle, 37.5 (21.3); F1, 31.3 (17.5); F2, 21.3 (20); clava 180 (25).

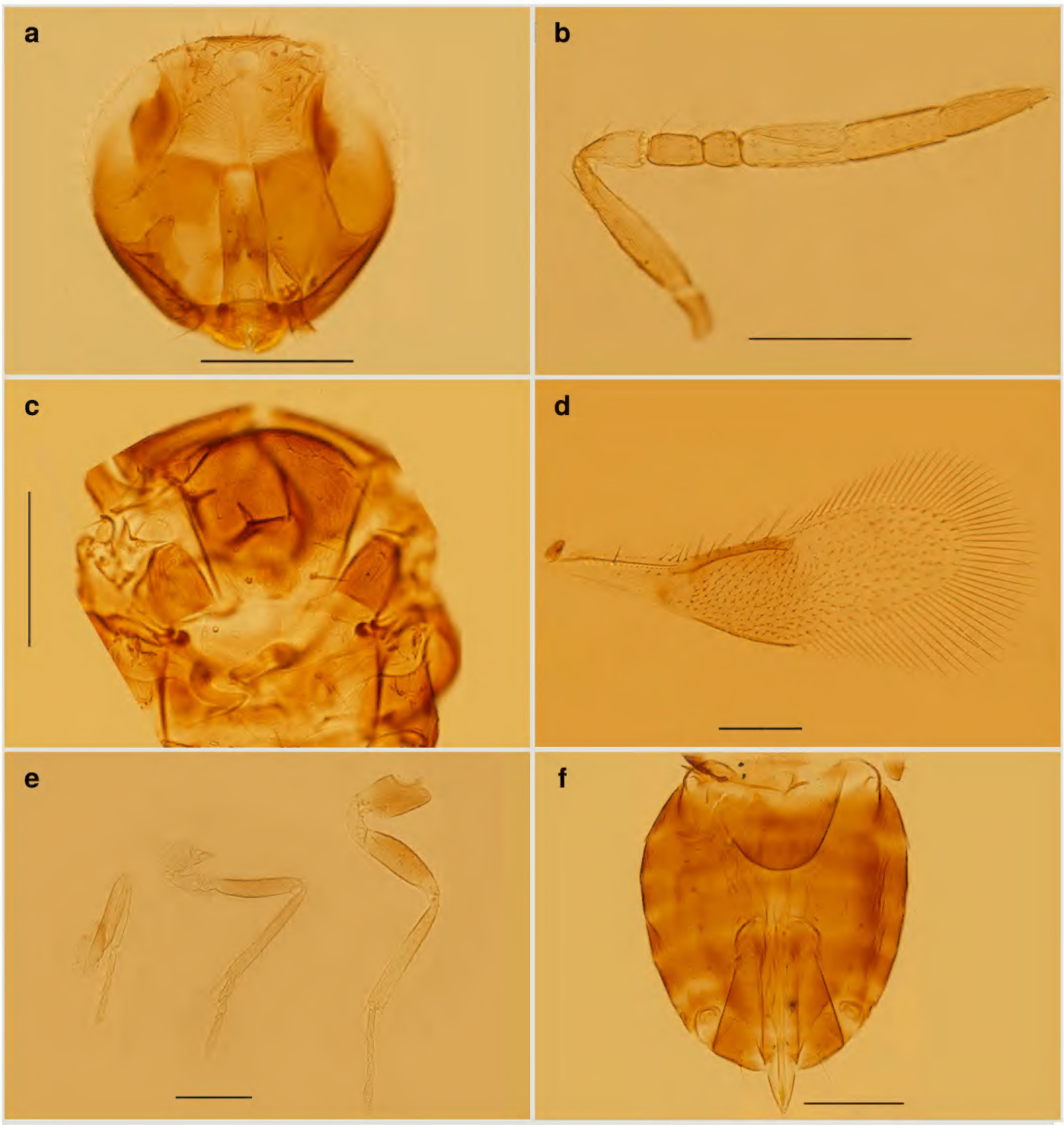


Figure 1.

*Pteroptrix pedicellata* sp. n., female.

**a**: Head, frontal view
**b**: Antenna
**c**: Mesosoma, dorsal from paratype
**d**: Fore wing
**e**: Legs
**f**: Metasoma, dorsal

Mesosoma. Mid-lobe of mesoscutum and axillae with reticulate sculpture; scutellum with extremely faint reticulation. Mid-lobe of mesoscutum 0.73× as long as wide, with 12 nearly symmetrically arranged setae; each side lobe and axilla with 1 seta;

scutellum 0.40× as long as wide and 0.63× as long as mid-lobe of mesoscutum. Placoid sensilla very close to the anterior scutellar setae; distance between anterior pair of scutellar setae 1.50× as long as the distance between posterior pair. Propodeum 2.60× the median length of metanotum and slightly salient posterior-medially. Mesopostphragma extending to posterior margin of TII. Fore wing (Fig. 1d) 3.55× as long as wide, densely and evenly setose; costal cell 1.58× as long as marginal vein, with 4 setae distally on dorsal surface and 4 relatively shorter setae medially on ventral surface; submarginal vein with 1 seta, marginal vein with 4 long setae along anterior margin; basal cell with 2 setae below apex of submarginal vein; marginal fringe 0.71× as long as the greatest width of disc. Hind wing 8.8× as long as wide, with 3 rows of setae on disc; marginal fringe 2.5× the greatest width of disc. Legs (Fig. 1e) with mid-tibial spur 1.31× as long as corresponding basitarsus. Measurements, length (width): fore wing, 495 (139.5); costal cell, 156.4; marginal vein, 99; stigmal vein, 30; marginal fringe, 99; hind wing, 435.6 (49.5); marginal fringe, 123.8; mid tibia, 158.4; mid-tibial spur, 45; mid basitarsus, 34.4; hind tibia, 178.2.

Metasoma (Fig. 1f). Ovipositor originating from base of TIV, 1.23× as long as mid-tibia and 1.09× as long as hind tibia, distinctly exserted at apex of gaster. Second valvifer 3.11× as long as third valvula, the latter 1.38× as long as mid basitarsus. Measurements: ovipositor, 195; second valvifer, 147.5; third valvula, 47.5.

Male. Unknown.

## Diagnosis

Female. Body length 0.51–0.55mm. Body largely brown to dark brown; antenna (Fig. 1b) mostly brown except pedicel and C1 paler; legs (Fig. 1e) extensively dark brown, except mid coxae and apical half of all tibiae pallid. Antennal formula 1123, radicle 2.0× as long as wide, scape 4.56–4.75× as long as wide, about as long as the length of pedicel and funicle combined; pedicle 1.58–1.76× as long as wide and 1.11–1.31× as long as F1; F1 1.22–1.86× as long as wide; F2 subquadrate, 0.65–0.75× as long as F1; clava 3.27–3.60× as long as funicle. Funicle segments devoid of sensilla, each clava segment with 1 or 2 sensilla. Mid-lobe of mesoscutum (Fig. 1c) with 11–13 setae, each side lobe with 1 seta. Fore wing (Fig. 1d) 3.54–3.58× as long as wide and with its marginal fringe 0.71–0.77× wing width. Ovipositor 1.16–1.23× as long as mid-tibia and with its second valvifer 2.70–3.11× as long as third valvula. The third valvula 1.38 –1.54× as long as mid basitarsus.

**Host:** Unknown.

## Etymology

The specific name refers to the fact that this species is with normal sized pedicel in comparison with *Pteroptrix macropedicellata* (Malac).

### Distribution

Tibet, Chayu County, Xiachayu Town

**Comments:** The new species belongs to the *dimidiata*-group (Viggiani and Garonna 1993) and superficially resembles *P. macropedicellata* (Malac) in having a similar body colour and setation on the mid-lobe of the mesoscutum. However, the new species can be separated from the latter (according to the description and figures of Nikol'skaya and Yasnosh (1966)) by the following combination of characters. *Pteroptrix pedicellata* sp. n. with relatively longer antennal scape, about as long as the combined length of pedicel, F1 and F2 (*vs* about as long as pedicel and F1 combined); normal sized pedicel, 1.58–1.76× as long as wide (*vs* 2×) and distinctly shorter than F1 + F2 (*vs* about as long as F1 + F2); shorter F1, 1.22–1.86× as long as wide (*vs* more than 2×); side lobe of mesoscutum with only 1 seta (*vs* 2 setae); relatively narrower fore wing, 3.54–3.58× as long as wide (*vs* about 3.11×).

## *Pteroptrix leptocera* (Huang) 1992

### Nomenclature

*Archenomus leptocerus* Huang: *Huang et al. (1992)*: 167. Holotype female, China, Fujian, FACC, not examined.

*Archenomus leptocerus*: *Huang (1994)*: 120; Xu and Huang (2004): 311.

*Pteroptrix leptocera*: Viggiani and Ren (1993): 237.

### Material

a. scientificName: *Pteroptrix leptocera*; originalNameUsage: *Archenomus leptocerus* Huang, 1992; country: China; stateProvince: Yunnan; county: Lianghe; samplingProtocol: yellowpan trapping; eventDate: 2013 04-29/05-01; sex: 2 females; lifeStage: adult; recordedBy: Xiang-xiang Jin; Guo-hao Zu; Chao Zhang; identifiedBy: Cheng-De Li; Ye Chen; dateIdentified: 2016-11; institutionCode: NEFU

**Host:** Unknown

### Distribution

China (Fujian, Yunnan [**new record**]).

**Comments:** Although this species was adequately described and illustrated by Huang et al. (1992), this is the first record from Yunnan Province, China.

## *Pteroptrix orientalis* (Silvestri) 1909

### Nomenclature

*Archenomus orientalis* Silvestri 1909: 563. Italy, not examined.

*Archenomus orientalis*: Prinsloo and Neser (1990): 24; Huang et al. (1992): 164; Huang (1994): 103; Xu and Huang (2004): 313.

*Pteroptrix orientalis*: Viggiani and Garonna (1993): 59; Viggiani and Ren (1986): 237.

### Materials

a. scientificName: *Pteroptrix orientalis*; originalNameUsage: *Archenomus orientalis* Silvestri 1909; country: China; stateProvince: Liaoning; county: Dalian City; municipality: Pulandian; samplingProtocol: sweeping; eventDate: 1994-06-05; sex: 1 female; lifeStage: adult; recordedBy: Cheng-De Li; identifiedBy: Cheng-De Li; institutionCode: NEFU

b. scientificName: *Pteroptrix orientalis*; country: China; stateProvince: Shandong; county: Qingdao City; municipality: Xiaozhu Mountain; samplingProtocol: sweeping; eventDate: 2014-5-20; sex: 3 females; lifeStage: adult; recordedBy: Xiang-xiang Jin;Guo-hao Zu;Si-zhu Liu; identifiedBy: Cheng-De Li; Ye Chen; dateIdentified: 2016-12; institutionID: NEFU

**Host:** *Pseudaulacaspis pentagona* (Targioni-Tozzetti) (Hemiptera:Diaspididae). (Huang (1994)).

### Distribution

China (Liaoning [**new record**], Shandong [**new record**], Fujian), South Korea, Japan, Italy, Dominican Republic (Noyes 2016).

Figure 2.

*Pteroptrix orientalis*, female: Antenna.

**Comments:** Our specimens agree well with the description of Huang (1994), but the following difference should be noted: in the material from Qingdao City, F3 as in Fig. 2 with one sensillum (sensilla present only on clava segments in Huang's description).

## *Pteroptrix processa* (Huang) 1991

### Nomenclature

*Archenomus processus* Huang (1991): 396. Holotype female, China, Jiangsu, FACC, not examined.

*Archenomus processus*: Huang (1994): 114; Xu and Huang (2004): 316.

*Pteroptrix processa*: Viggiani and Ren (1993): 237; Viggiani and Garonna (1993): 61.

### Materials

a. scientificName: *Pteroptrix processa*; originalNameUsage: *Archenomus processus* Huang 1991; country: China; stateProvince: Beijing City; municipality: Chinese Academy of Sciences, Institute of Botany; samplingProtocol: yellowpan trapping; eventDate: 2012-05-09; sex: 1 female; lifeStage: adult; recordedBy: Xiu-Wei Liu; identifiedBy: Cheng-De Li; Ye Chen; dateIdentified: 2016-11; institutionID: NEFU

b. scientificName: *Pteroptrix processa*; country: China; stateProvince: Shaanxi; county: Ningshan; municipality: Guanghuojie Town; samplingProtocol: sweeping; sex: 1 male; lifeStage: adult; recordedBy: Ye Chen; Chao Zhang; identifiedBy: Cheng-De Li; Ye Chen; dateIdentified: 2016-1; institutionID: NEFU

### Description

Male. Body length 0.5 mm. Colouration similar to that of female, largely brown to dark brown. Antenna (Fig. 3a) with radicle 2.73× as long as wide; scape 4.33× as long as wide; pedicle slightly longer than wide and 0.63× as long as F1; funicle segments with F2 shortest, F3 a little longer than F1. Mid-lobe of mesoscutum with 2 setae, propodeum distinctly salient posterior-medially and 3.6 × as long as metanotum. Fore wing (Fig. 3b) 2.8 × as long as wide, marginal fringe 0.48 × as long as the greatest width of wing. Genitalia as in Fig. 3c and 0.55 × as long as midtibia.

**Host:** *Pseudaulacaspis pentagona* (Targioni-Tozzetti) (Hemiptera: Diaspididae), (Huang 1991).

### Distribution

China (Fujian, Jiangsu, Beijing [**new record**], Shaanxi [**new record**]).

**Comments:** This species is unique for the genus in having the mid-lobe of mesoscutum with only 2 setae and propodeum distinctly salient posterior-medially. This is the first report for its male.

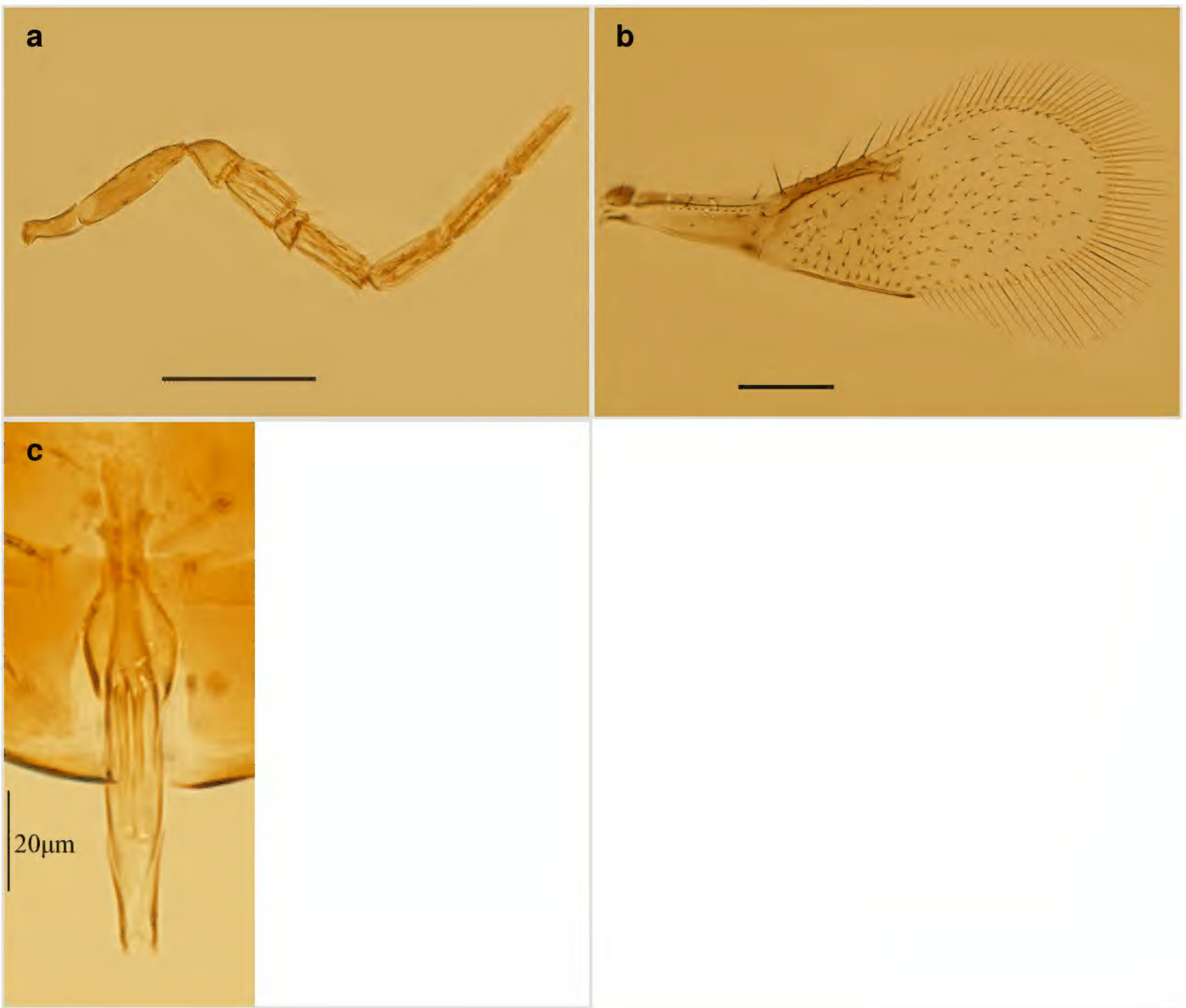


Figure 3.

*Pteroptrix processa*, male

**a**: Antenna
**b**: Fore wing
**c**: Genitalia

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